



SEQUENCE LISTING

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<120> IMPROVED NUCLEIC ACIDS ENCODING A CHIMERIC
GLYCOSYLTRANSFERASE

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<151> 1996-08-02

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<170> PatentIn Ver. 2.1

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<213> Sus Domesticus

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10

ttc atc ctc ttt gtc ttc acg gct tcc acc ata ttt cac ctt cag cag 98

Phe Ile Leu Phe Val Phe Thr Ala Ser Thr Ile Phe His Leu Gln Gln

15

20

25

30

agg atg gtg aag att caa ccc acg tgg gag tta cag atg gtg acg cag 146

Arg Met Val Lys Ile Gln Pro Thr Trp Glu Leu Gln Met Val Thr Gln

35

40

45

gtg acc aca gag agc ccc tcg agc ccc cag ctg aag ggc atg tgg acg 194
Val Thr Thr Glu Ser Pro Ser Ser Pro Gln Leu Lys Gly Met Trp Thr
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atc aat gcc atc ggc cgc ctg ggg aac cag atg ggg gag tac gcc acc 242
Ile Asn Ala Ile Gly Arg Leu Gly Asn Gln Met Gly Glu Tyr Ala Thr
65 70 75

ctg tac gcg ctg gcc agg atg aac ggg cgg ccg gcc ttc atc ccg ccc 290
Leu Tyr Ala Leu Ala Arg Met Asn Gly Arg Pro Ala Phe Ile Pro Pro
80 85 90

gag atg cac agc acg ctg gcc ccc atc ttc agg atc acc ctc ccg gtc 338
Glu Met His Ser Thr Leu Ala Pro Ile Phe Arg Ile Thr Leu Pro Val
95 100 105 110

ctg cac gcc agc acg gcc cgc agg atc ccc tgg cag aac tac cac ctg 386
Leu His Ala Ser Thr Ala Arg Arg Ile Pro Trp Gln Asn Tyr His Leu
115 120 125

aac gac tgg atg gag gag cgg tac cgc cac atc ccg ggg gag tac gtg 434
Asn Asp Trp Met Glu Glu Arg Tyr Arg His Ile Pro Gly Glu Tyr Val
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cgc ctc acg ggc tac ccc tgc tcc tgg acc ttc tac cac cac ctg cgc 482
Arg Leu Thr Gly Tyr Pro Cys Ser Trp Thr Phe Tyr His His Leu Arg
145 150 155

acc gag atc ctc cgg gag ttc acc ctg cat aac cac gtg cgc gag gag 530
Thr Glu Ile Leu Arg Glu Phe Thr Leu His Asn His Val Arg Glu Glu
160 165 170

gcc cag gat ttc ctg cgg ggt ctg cgg gtg aac ggg agc cga ccg agt 578
Ala Gln Asp Phe Leu Arg Gly Leu Arg Val Asn Gly Ser Arg Pro Ser
175 180 185 190

acc tac gtg ggg gtg cac gtg cgc cgg ggg gac tac gtg cac gtg atg 626
Thr Tyr Val Gly Val His Val Arg Arg Gly Asp Tyr Val His Val Met
195 200 205

ccc aac gtg tgg aag ggc gtg gtg gcc gac cgg cgg tac ctg gag cag 674
Pro Asn Val Trp Lys Gly Val Val Ala Asp Arg Arg Tyr Leu Glu Gln
210 215 220

gcc ctg gac tgg ttc cgg gct cgc tac cgc tcc ccc gtc ttt gtg gtc 722
Ala Leu Asp Trp Phe Arg Ala Arg Tyr Arg Ser Pro Val Phe Val Val
225 230 235

tcc agc aac ggc atg gcc tgg tgt cgg gaa aac atc aat gcc tcg cgc 770
 Ser Ser Asn Gly Met Ala Trp Cys Arg Glu Asn Ile Asn Ala Ser Arg
 240 245 250

ggc gat gtg gtg ttt gcc ggc aat ggc atc gag ggc tcc ccc gcc aaa 818
 Gly Asp Val Val Phe Ala Gly Asn Gly Ile Glu Gly Ser Pro Ala Lys
 255 260 265 270

gac ttc gcg ctg ctc acg cag tgt aac cac act gtc atg acc att ggc 866
 Asp Phe Ala Leu Leu Thr Gln Cys Asn His Thr Val Met Thr Ile Gly
 275 280 285

acg ttc ggg atc tgg gcc gcc tac ctt gct ggt gga gag acc atc tac 914
 Thr Phe Gly Ile Trp Ala Ala Tyr Leu Ala Gly Gly Glu Thr Ile Tyr
 290 295 300

ctg gcc aat tac acg ctc ccg gac tct ccc ttc ctc aaa ctc ttt aag 962
 Leu Ala Asn Tyr Thr Leu Pro Asp Ser Pro Phe Leu Lys Leu Phe Lys
 305 310 315

ccc gag gca gcc ttc ctg ccc gag tgg att ggg atc gag gca gac ctg 1010
 Pro Glu Ala Ala Phe Leu Pro Glu Trp Ile Gly Ile Glu Ala Asp Leu
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 Val Lys Ile Gln Pro Thr Trp Glu Leu Gln Met Val Thr Gln Val Thr
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 Thr Glu Ser Pro Ser Ser Pro Gln Leu Lys Gly Met Trp Thr Ile Asn
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 Ala Ile Gly Arg Leu Gly Asn Gln Met Gly Glu Tyr Ala Thr Leu Tyr
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 Ala Leu Ala Arg Met Asn Gly Arg Pro Ala Phe Ile Pro Pro Glu Met
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 His Ser Thr Leu Ala Pro Ile Phe Arg Ile Thr Leu Pro Val Leu His

100 105 110
 Ala Ser Thr Ala Arg Arg Ile Pro Trp Gln Asn Tyr His Leu Asn Asp
 115 120 125
 Trp Met Glu Glu Arg Tyr Arg His Ile Pro Gly Glu Tyr Val Arg Leu
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 Thr Gly Tyr Pro Cys Ser Trp Thr Phe Tyr His His Leu Arg Thr Glu
 145 150 155 160
 Ile Leu Arg Glu Phe Thr Leu His Asn His Val Arg Glu Glu Ala Gln
 165 170 175
 Asp Phe Leu Arg Gly Leu Arg Val Asn Gly Ser Arg Pro Ser Thr Tyr
 180 185 190
 Val Gly Val His Val Arg Arg Gly Asp Tyr Val His Val Met Pro Asn
 195 200 205
 Val Trp Lys Gly Val Val Ala Asp Arg Arg Tyr Leu Glu Gln Ala Leu
 210 215 220
 Asp Trp Phe Arg Ala Arg Tyr Arg Ser Pro Val Phe Val Val Ser Ser
 225 230 235 240
 Asn Gly Met Ala Trp Cys Arg Glu Asn Ile Asn Ala Ser Arg Gly Asp
 245 250 255
 Val Val Phe Ala Gly Asn Gly Ile Glu Gly Ser Pro Ala Lys Asp Phe
 260 265 270
 Ala Leu Leu Thr Gln Cys Asn His Thr Val Met Thr Ile Gly Thr Phe
 275 280 285
 Gly Ile Trp Ala Ala Tyr Leu Ala Gly Gly Glu Thr Ile Tyr Leu Ala
 290 295 300
 Asn Tyr Thr Leu Pro Asp Ser Pro Phe Leu Lys Leu Phe Lys Pro Glu
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<220>
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tgt gtt tta gca gca att ttc ttc ctg aac gtc tat caa gac ctc ttt 96
 Cys Val Leu Ala Ala Ile Phe Phe Leu Asn Val Tyr Gln Asp Leu Phe
 20 25 30

tac agt ggc tta gac ctg ctg gcc ctg tgt cca gac cat aac gtg gta 144
 Tyr Ser Gly Leu Asp Leu Leu Ala Leu Cys Pro Asp His Asn Val Val
 35 40 45

tca tct ccc gtg gcc ata ttc tgc ctg gcg ggc acg ccg gta cac ccc 192
 Ser Ser Pro Val Ala Ile Phe Cys Leu Ala Gly Thr Pro Val His Pro
 50 55 60

aac gcc tcc gat tcc tgt ccc aag cat cct gcc tcc ttt tcc ggg acc 240
 Asn Ala Ser Asp Ser Cys Pro Lys His Pro Ala Ser Phe Ser Gly Thr
 65 70 75 80

tgg act att tac ccg gat ggc cgg ttt ggg aac cag atg gga cag tat 288
 Trp Thr Ile Tyr Pro Asp Gly Arg Phe Gly Asn Gln Met Gly Gln Tyr
 85 90 95

gcc acg ctg ctg gcc ctg gcg cag ctc aac ggc cgc cag gcc ttc atc 336
 Ala Thr Leu Leu Ala Leu Ala Gln Leu Asn Gly Arg Gln Ala Phe Ile
 100 105 110

cag cct gcc atg cac gcc gtc ctg gcc ccc gtg ttc cgc atc acg ctg 384
 Gln Pro Ala Met His Ala Val Leu Ala Pro Val Phe Arg Ile Thr Leu
 115 120 125

cct gtc ctg gcg ccc gag gta gac agg cac gct cct tgg cgg gag ctg 432
 Pro Val Leu Ala Pro Glu Val Asp Arg His Ala Pro Trp Arg Glu Leu
 130 135 140

gag ctt cac gac tgg atg tcc gag gat tat gcc cac tta aag gag ccc 480
 Glu Leu His Asp Trp Met Ser Glu Asp Tyr Ala His Leu Lys Glu Pro
 145 150 155 160

tgg ctg aag ctc acc ggc ttc ccc tgc tcc tgg acc ttc ttc cac cac 528
 Trp Leu Lys Leu Thr Gly Phe Pro Cys Ser Trp Thr Phe Phe His His
 165 170 175

ctc cgg gag cag atc cgc agc gag ttc acc ctg cac gac cac ctt cgg 576
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caa gag gcc cag ggg gta ctg agt cag ttc cgt cta ccc cgc aca ggg 624
 Gln Glu Ala Gln Gly Val Leu Ser Gln Phe Arg Leu Pro Arg Thr Gly
 195 200 205

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 Asp Arg Pro Ser Thr Phe Val Gly Val His Val Arg Arg Gly Asp Tyr
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ctg cgt gtg atg ccc aag cgc tgg aag ggg gtg gtg ggt gac ggc gct 720
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tac ctc cag cag gct atg gac tgg ttc cgg gcc cga tac gaa gcc ccc 768
 Tyr Leu Gln Gln Ala Met Asp Trp Phe Arg Ala Arg Tyr Glu Ala Pro
 245 250 255

gtc ttt gtg gtc acc agc aac ggc atg gag tgg tgc cgg aag aac atc 816
 Val Phe Val Val Thr Ser Asn Gly Met Glu Trp Cys Arg Lys Asn Ile
 260 265 270

gac acc tcc cgg ggg gac gtg atc ttt gct ggc gat ggg cgg gag gcc 864
 Asp Thr Ser Arg Gly Asp Val Ile Phe Ala Gly Asp Gly Arg Glu Ala
 275 280 285

gcg ccc gcc agg gac ttt gcg ctg ctg gtg cag tgc aac cac acc atc 912
 Ala Pro Ala Arg Asp Phe Ala Leu Leu Val Gln Cys Asn His Thr Ile
 290 295 300

atg acc att ggc acc ttc ggc ttc tgg gcc gcc tac ctg gct ggt gga 960
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gat acc atc tac ttg gct aac ttc acc ctg ccc act tcc agc ttc ctg 1008
 Asp Thr Ile Tyr Leu Ala Asn Phe Thr Leu Pro Thr Ser Ser Phe Leu
 325 330 335

aag atc ttt aaa ccc gag gct gcc ttc ctg ccc gag tgg gtg ggc att 1056
 Lys Ile Phe Lys Pro Glu Ala Ala Phe Leu Pro Glu Trp Val Gly Ile
 340 345 350

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<213> Sus Domesticus

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Tyr	Ser	Gly	Leu	Asp	Leu	Leu	Ala	Leu	Cys	Pro	Asp	His	Asn	Val	Val		
		35					40					45					
Ser	Ser	Pro	Val	Ala	Ile	Phe	Cys	Leu	Ala	Gly	Thr	Pro	Val	His	Pro		
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Asn	Ala	Ser	Asp	Ser	Cys	Pro	Lys	His	Pro	Ala	Ser	Phe	Ser	Gly	Thr		
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Trp	Thr	Ile	Tyr	Pro	Asp	Gly	Arg	Phe	Gly	Asn	Gln	Met	Gly	Gln	Tyr		
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Ala	Thr	Leu	Leu	Ala	Leu	Ala	Gln	Leu	Asn	Gly	Arg	Gln	Ala	Phe	Ile		
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Glu	Leu	His	Asp	Trp	Met	Ser	Glu	Asp	Tyr	Ala	His	Leu	Lys	Glu	Pro		
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Leu	Arg	Glu	Gln	Ile	Arg	Ser	Glu	Phe	Thr	Leu	His	Asp	His	Leu	Arg		
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Gln	Glu	Ala	Gln	Gly	Val	Leu	Ser	Gln	Phe	Arg	Leu	Pro	Arg	Thr	Gly		
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225					230				235						240		
Tyr	Leu	Gln	Gln	Ala	Met	Asp	Trp	Phe	Arg	Ala	Arg	Tyr	Glu	Ala	Pro		
				245					250					255			
Val	Phe	Val	Val	Thr	Ser	Asn	Gly	Met	Glu	Trp	Cys	Arg	Lys	Asn	Ile		
			260					265					270				
Asp	Thr	Ser	Arg	Gly	Asp	Val	Ile	Phe	Ala	Gly	Asp	Gly	Arg	Glu	Ala		
		275					280					285					
Ala	Pro	Ala	Arg	Asp	Phe	Ala	Leu	Leu	Val	Gln	Cys	Asn	His	Thr	Ile		
		290				295					300						
Met	Thr	Ile	Gly	Thr	Phe	Gly	Phe	Trp	Ala	Ala	Tyr	Leu	Ala	Gly	Gly		
305					310				315					320			
Asp	Thr	Ile	Tyr	Leu	Ala	Asn	Phe	Thr	Leu	Pro	Thr	Ser	Ser	Phe	Leu		
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Lys	Ile	Phe	Lys	Pro	Glu	Ala	Ala	Phe	Leu	Pro	Glu	Trp	Val	Gly	Ile		
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Homo Sapiens and Sus Domesticus

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<211> 39
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Homo Sapiens and Sus Domesticus

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<212> DNA
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Homo Sapiens and Sus Domesticus

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Homo Sapiens and Sus Domesticus

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